COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

Massachusetts Electric Company Restructuring Settlement Agreement	)	DPU 96-25

INITIAL BRIEF OF THE UNION OF CONCERNED SCIENTISTS

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Massachusetts Electric Restructuring Settlement Agreement, DPU 96-25
Initial Brief of the Union of Concerned Scientists --

The Union of Concerned Scientists ("UCS") is pleased to submit this Initial Brief in the Massachusetts Electric Company ("MECo" or "the Company") restructuring proceeding. In this brief, UCS will address only the renewable energy provisions of the Massachusetts Electric Restructuring Settlement Agreement. UCS supports these provisions as reasonable in terms of:

- the Department of Public Utilities ("DPU") orders in DPU 96-100 and DPU 95-30, and previous DPU precedent;
- the market barriers and failures facing renewable energy in restructured electricity generation markets, and the benefits to utility customers of provisions to overcome those barriers; and
- policies which have been approved and proposed in other jurisdictions.

We will also show that the arguments made by the Center for Energy and Economic Development ("CEED") opposing the renewables provisions are specious. The testimony of CEED's witness Thomas Hewson (Ex. CEED-1) is contradicted by CEED's own previous analysis of the costs of renewable energy supply, as well as by the testimony of UCS witness Alan Nogee and by the U.S. Department of Energy, the Electric Power Research Institute and other independent sources.

The Settlement Agreement is reasonable with respect to the DPU restructuring orders, previous DPU precedent, and Massachusetts public policy.

In its May 1 order, the DPU proposed a Renewables Fund which would be supported through a system benefit charge suggested at one mill per kWh (DPU 96-100 at 68). The Department's order in DPU 95-30 also permitted utilities to make and recover transition expenditures promoting the development of renewable energy investments. The Department noted that

> electric utilities may incur some costs during the transition period in order to attain stated public policy objectives. The Department will ensure that electric utilities with any such prudently-incurred costs will have a reasonable opportunity to recover them before the transition period ends.... (DPU 95-30 at 33)

Among public policy goals which the Department stated it seeks to preserve are "...environmental protection[1], energy security, fuel diversity, and continued technological advance through research and development" (DPU 95-30 at 2-3). UCS presented testimony that renewable energy technologies provide all of these benefits, and that doing so will reduce costs for utility customers (Testimony of Alan Nogee, Exhibit UCS-1 at 5-6) The Department also found that renewables projects provided these benefits in its review of the MECo "Green RFP" in DPU 94-49 (see Ex. UCS-1 at 4, footnote 1).

The renewables system benefit charge in the Restructuring Settlement Agreement ("RSA") starts at 0.25 mills per kWh in 1998, and increases to 0.55 mills per kWh in 1999, 0.85 mills per kWh in 2000, and 1.25 mills per kWh in 2001. Funding after 2001 would be determined by the DPU based on a recommended goal of adding new renewable generation equal to four percent of total Massachusetts kWh sales by the end of 2007. As Mr. Nogee testified, the funding levels in the agreement are less than proposed by the Department in DPU 96-100 on average over the four years for which funding levels are

[1] While the DPU's mission does not include environmental protection *per se*, it does have the authority to consider environmental impacts that are likely to increase costs to utility customers in the future.

specifically defined in the agreement, and would equal the present value of DPU 96-100 proposal if the charge were to continue for a full ten years (Ex. UCS-1 at 2).

The RSA states that spending plans for renewables will be approved by the Department based on collaborative input. As Mr. Nogee testified, the Department therefore retains full authority to disapprove any proposal or mix of proposals that it finds would not provide sufficient benefits to Massachusetts Electric customers (Ex. UCS-1 at 7). Should the collaborative input or DPU decision determine that there are insufficient opportunities to spend the entire budget on projects which are likely to provide benefits to utility customers, the RSA provides for carrying over renewables funding to a subsequent year. Additionally, the four year renewables ramp-up in the RSA permits great flexibility to adjust funding levels after 2001 to respond to a wide range of conditions and program results over the first four years. The Department also would retain the complete flexibility and authority to adjust the renewables kWh sales goal, if appropriate, to ensure that the system benefit charge always continues to provide economic benefits to utility customers.

The renewables funding levels and long-term goal are reasonable for overcoming barriers to these technologies competing fairly in restructured electricity markets.

UCS's witness detailed how renewable energy technologies face a number of barriers in competing fairly with conventional generating technologies in a deregulated generation market, testified that if these barriers are not addressed, electricity customers will likely face higher long-run costs. These barriers include market transaction barriers, commercialization barriers and market failures to value long-term benefits and benefits which accrue to all utility customers, as opposed to benefits which accrue only to customers making specific purchase decisions (Ex. UCS-1 at 5).

Mr. Nogee also testified that a system benefit charge of one to two mill per kWh would be reasonable to create a fund which would help overcome those barriers; that level of funding would be likely to achieve a goal of increasing the proportion of renewables generation by four percentage points of total kWh sales; and that this renewables sales goal would help create market pull, combined with demand from other regions, to continue renewable energy technology price declines and the sustained orderly development of these technologies (Ex. UCS-1 at 7-8).

The RSA renewables provisions are reasonable compared to policies adopted in other jurisdictions.

UCS' witness testified that the level of funding proposed for renewables in the Restructuring Settlement Agreement is consistent with funding levels adopted in California restructuring legislation. He also testified that the proposed renewables sales goal is less than or comparable to renewables goals

adopted in California, Minnesota, Iowa, and the United Kingdom (Ex. UCS-1 at 8-9).

The CEED witness erred in defining the technologies that would be supported, their environmental characteristics, and the cost of the RSA renewables provisions.

The Center for Energy and Economic Development ("CEED") sponsored the testimony of Thomas Hewson. According to documents downloaded by Mr. Nogee from the CEED's Internet site: CEED began as a historic union of coal and rail, working for America's coal-powered future.

> CEED's membership is expanding to include utilities, suppliers to coal and rail, and associated industries.... CEED is working to get more coal plants built and to repower existing plants for coal use.... With regional offices across the country, CEED is working at the state and local level to power America's electric future with coal (Ex. AG-1, last page).

Mr. Hewson criticizes the settlement for purporting to promote "clean" renewable generation, whereas he claims these projects will have negative environmental impacts, citing emissions from existing biomass and MSW combustion facilities (CEED-1 at 11). Mr. Hewson simply ignores the fact that the settlement agreement would not fund these technologies, according to its plain language and the testimony of Mr. Nogee (Tr. 3-251). For biomass resources, the agreement provides funding only for "low emission advanced biomass power conversion technologies like gasification..." (Ex. MECo-1 at 25).

Mr. Hewson criticized the renewables sales goal in the settlement, testifying that meeting the goal would require a subsidy of $8-10/MWh (8-10 mills per kWh) if captured from MECo customers (CEED-1 at 15). Mr. Hewson's "calculations" are based on an absurd interpretation of the settlement; on speculation that certain decisions would be made by future commissions which are not required by the settlement and have not been advocated by any party to the settlement; and on assumptions about the cost of renewables which are contrary to all available evidence, including a national report by CEED.

First, Mr. Hewson's calculation assumes that the cost of meeting the statewide goal for renewables would be borne exclusively by MECo customers, although acknowledges that the charge would be lower if spread across all Massachusetts customers (Ex. CEED-1 at 15). Nothing in the settlement would indicate any intent to place the burden of meeting the entire state renewables goal on Massachusetts Electric customers, as opposed to MECo's proportionate share. UCS would not object to modifying settlement language or the Department clarifying this point in its order, if the Department thinks that the present language is ambiguous.

Second, Mr. Hewson acknowledges that the goal of adding new renewables equal to four percent of total Massachusetts electric sales, which is recommended to guide funding after the year 2001 "is

non-enforceable and may be revised based upon market barriers and experience." (*id*. at 14). Even assuming, *arguendo*, that Mr. Hewson's projected costs for renewables were to turn out to be correct, the Department in 2001 would be completely free to modify the goal to ensure that program costs were reasonable and beneficial to electricity customers. Moreover, no party in the current proceeding or in DPU 96-100 has advocated a renewables system benefit charge in excess of two mills per kWh.

Third, as discussed below, Mr. Hewson's assumptions about future renewables costs are contradicted by historical and current experience, by CEED's own previously published study on renewable energy costs,[2] by the testimony of UCS' witness, by the U.S. Department of Energy's ("DOE") National Renewable Energy Lab ("NREL") , and by independent studies cited in Mr. Nogee's testimony performed by the Electric Power Research Institute ("EPRI") , by the Utility Photovoltaic Group ("UPVG"), by the New England Governors' Conference ("NEGC"), and by the Arthur D. Little ("ADL") consulting group.

Mr. Hewson testifies that renewable energy costs "will likely range from 7-15 cents per kWh (1996$)" (Ex. CEED-1 at 15). He then goes on to assume that renewable production costs "remain approximately $0.075 more expensive than conventional generation," which he testifies costs "2-3 cent/kWh for existing baseload fossil fuel units or the 3-5 cents/kWh for new fossil fuel fired generation alternatives." (*id.*) He thus assumes that the average price of new renewable generation is 10 cents/kWh today (7.5 cents above existing fossil), and will be about 11.5 cents/kWh in the future (7.5 cents above new fossil). Mr. Hewson testified that he relied upon CEED's national study on renewable energy costs (Ex. CEED-2) for his renewable energy cost projections (Tr. 3-239).

However, even in CEED's own study, performed by the RDI consulting group, the 1995 levelized cost for windpower in New England, based on class 4 wind resources, is 6.8 cents/kWh, below the low end of Mr. Hewson's range. The price of wind energy class 5 wind resources is 6.1 cents/kWh (Ex. CEED-2 at 4-5; Tr. 3-245). According to the CEED report, the levelized cost of new gas CC and of AFBC coal plants in New England is 4.2 cents/kWh and 5.1 cents/kWh, respectively. Thus, in the CEED report, the incremental cost of class 5 wind would be only 1.0 - 1.9 cents/kWh above new fossil plants, when compared using the same levelizing assumptions and method. The incremental cost of class 4 wind plants would be 1.7 - 2.6 cents/kWh , still far below the 7.5 cents/kWh incremental cost assumed in Mr. Hewson's testimony.

Mr. Hewson admitted that he had no direct knowledge of New England wind resources, relying on a wind map in the CEED study for his conclusion that Massachusetts has no wind resources of Class

[2]Energy Choices in a Competitive Era: The Role of Renewable and Traditional Energy Resources in America's Electric Generation Mix, Prepared by Resource Data International,, Prepared for Center for Energy and Economic Development, Alexandria, Virginia, April 1995, Ex. CEED-2.

4, 5, or 6 (Tr.3-225,245). The wind map in the CEED study (Ex. CEED-2 at 2-12) does clearly show large areas of class 4, 5, and 6 wind resources in the three northern New England states, however, and Mr. Hewson admits that there is no reason why Massachusetts utility customers cannot access those resources (Tr. 3-244,5). Additionally, Mr. Nogee testified that, based on his knowledge of New England wind resources, there are class 4, 5, and 6 wind resources in New England, including even some class 6 resources off-shore in Massachusetts and on Nantucket (Tr. 3-261).

Actual recent New England experience has also produced renewables at a price below the low end of Mr. Hewson's 7-15 cent/kWh assumed range for renewables costs. Landfill gas facilities already on line average only 5.98 cents per kWh (MECO Response to IR CEED 1-20). Mr. Nogee testified that the wind power contract signed in MECo's Green RFP was for 5.1 cents per kWh (real levelized) (Tr. 3-258).

The DOE's National Renewable Energy Laboratory ("NREL") has critiqued the national CEED study, comparing CEED's projected renewable energy technology costs to DOE's. The NREL critique found that 1995 wind energy costs are 5.3 cents/kWh compared to CEED's projection of 6.8 cents/kWh (Tr. 4-237, 238; Ex. AG-2, 2nd page). The costs of all other renewables included in the CEED report are also overstated, according to NREL (*id*.)

Even more importantly, in the CEED report, the levelized cost of every renewable remains the same throughout the study period. (As noted above, Mr. Hewson even assumes the average cost of the renewables portfolio will increase from current levels.) But according to the DOE projections cited in the NREL study, the levelized cost of every renewable will decline significantly between 1995 and 2010, except for waste-to-energy, which remains constant. The price of wind will drop from 5.3 cents/kWh in 1995 to 3.5 cents/kWh in 2010. The price of biomass will fall from 8.5 to 7.2 cents/kWh. The price of PV will decline from 21.8 cents to 8.7 cents/kWh. (*id*.)

UCS' witness testified that total cost to distribution company customers of a balanced renewables portfolio to meet the four percent of sales target over a ten year period would be in the range of one to two mills per kWh, or 50 cents to one dollar per month per typical residential customer. This calculation assumed that an optimistic cost for a renewables portfolio would be about six to seven cents per kWh (real levelized 1994$; DPU 96-100, Final Comments/Brief of UCS at 6, Incorporated by reference into Ex. UCS-1 at 2), compared to a (real levelized) market price of about 3 to 3.5 cents/kWh (DPU 96-100, Second Round Comments of UCS at 12 and at Table 1). The incremental above-market costs of the renewables portfolio would thus average 2.5 to 4 cents/kWh (Tr. 3-259,60), in contrast to the 7.5 cent/kWh incremental cost assumed in Mr. Hewson's testimony.

Mr. Nogee testified that his price projections for wind, which decline with increasing total wind capacity, were based on projected wind capital costs from the EPRI Technical Assessment Guide (*id*. at

10). His declining price projections for photovoltaics were based on projections by EPRI, ADL, and the Utility Photovoltaic Group (*id*. at 11; see also DPU 96-100, Initial Comments, Attachment 1, Figure 1, produced by UPVG). His biomass projections were based on EPRI and U.S. DOE (*id*. at 11). And his declining fuel cell price projections were based on studies by ADL. (*id*. at 11-12).

Mr. Nogee also cited a preliminary study by the New England Governors' Conference which examined the total cost of a renewables goal equal to 50 percent of all new capacity. The NEGC study found that the average annual incremental cost of the renewables portfolio to electricity customers would be about 1/3 of a mill per kWh (1993 dollars), and up to 1.14 mills/kWh at their highest point in 2003. (*id*. at 13 and Figure 3).

Mr. Hewson's renewables price projections are thus at odds with all record evidence, including CEED's own study. But, in any case, the settlement requires Department approval of proposed spending plans, based on collaborative input, for budgets between 1998 and 2001, giving the Department full authority to reject spending on any technologies or projects it considers not to be beneficial. It requires the Department to set explicit overall funding levels after the year 2001, and it allows the Department to revise the long-term goal at any time.

Finally, Mr. Hewson recommends that if the DPU does adopt the settlement, it follow the lead of the California legislature and limit renewables support to a period of four years (CEED-1 at 17). Mr. Hewson completely ignores the fact that California has far outpaced the nation in support for renewables for more than a decade. In its own report, CEED points out that, "[b]y the 1990s, 36% of the nation's renewable energy capacity was located in California, with over 90% of all solar, geothermal, and wind capacity located in the state." (CEED-2 at 2-3). California has provided far more than its fair share of the nation's support for developing new clean renewables. The decision of the California legislature to provide another $465 million to $540 million to support above-market costs of non-hydro renewables over another four years must be viewed in this context. Indeed, UCS would be very pleased if the DPU were to continue its support for renewables only until they achieve the same market share in Massachusetts that renewables currently have in California.

CEED's criticism of the renewables provisions of the settlement are without merit. UCS urges the DPU to approve the renewables provisions. Thank you.

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CERTIFICATE OF SERVICE

I hereby certify that I have, on this date, caused the foregoing document to be served by first class mail to all parties on the service list, except by hand to the Department on December 17th and by overnight mail on December 17th to the Center for Energy and Economic Development.

Dated: December 16, 1996

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